IN THE CLAIMS:

1. In a communications system having a communications line with a master transceiver at a first end and a slave transceiver at a second end, each transceiver having a noise reduction system, a timing recovery system and at least one equalizer, all converging at startup of the system, a startup protocol comprising the step of:

for each transceiver, separating the convergence of the equalizer and the timing recovery system from the convergence of the noise reduction system.

2. The startup protocol of claim 1 wherein the step of separating the convergence of the equalizer and the timing recovery system from the convergence of the noise reduction system comprises the steps of:

converging the equalizer and the timing recovery system of the slave while converging the noise reduction system of the master;

upon completion of converging the equalizer and the timing recovery system of the slave and the noise reduction system of the master, converging the equalizer and the timing recovery system of the master while converging the noise reduction system of the slave; and

upon completion of converging the equalizer and the timing recovery system of the master and the noise reduction system of the slave; reconverging the noise reduction system of the master.

3. The startup protocol of claim 2 wherein the step of converging the equalizer and the timing recovery system of the master while converging the noise reduction system of the slave further comprises the step of resetting the noise reduction system of the master.

4. The startup protocol of claim 2 wherein the step of converging the equalizer and the timing recovery system of the master while converging the noise

reduction system of the slave further comprises the step of freezing the timing recovery system of the slave.

5. The startup protocol of claim 1 wherein each of the noise reduction systems include an echo canceller.

6. The startup protocol of claim 5 wherein each of the noise reduction systems further include a NEXT cancellation system.

7. A startup protocol for use in a communications system having a plurality of transceivers, one transceiver acting as a master and another transceiver acting as slave, each transceiver having a noise reduction system, a timing recovery system and at least one equalizer, said protocol comprising the steps of:

executing a first stage during which the timing recovery system and the equalizer of the slave are trained and the noise reduction system of the master is trained;

executing a second stage during which the timing recovery system and the equalizer of the master are trained and the noise reduction system of the slave is trained; and

executing a third stage during which the noise reduction system of the master is retrained.

8. The startup protocol of claim 7 further comprises the steps of:

transitioning from the first stage to the second stage; and

transitioning from the second stage to the third stage.

9. The startup protocol of claim 8 wherein each stage is of a fixed time duration and the transitioning between stages occurs upon completion of the time duration.

10. The startup protocol of claim 9 wherein the time duration of the stages are substantially equal.

11. The startup protocol of claim 8 wherein the step of transitioning from the first stage to the second stage comprises the steps of:

transmitting a signal from the slave to the master;

detecting the signal at the master; and

ceasing transmission from the master.

12. The startup protocol of claim 11 wherein the transmission of the signal from the slave occurs upon completion of the training of the timing recovery system and the equalizer of the slave.

13. The startup protocol of claim 8 wherein the step of transitioning from the second stage to the third stage comprises the steps of:

transmitting a signal from the master to the slave;

detecting the signal at the slave; and

continuing transmission from the slave.

14. The startup protocol of claim 13 wherein the transmission of the signal from the master occurs upon completion of the training of the timing recovery system and the equalizer of the master.

15. A startup protocol for use in a communications system having a master transceiver at one end of a twisted wire pair and a slave transceiver at the opposite end of the twisted wire pair, each transceiver having a near-end noise reduction system, a far-end noise reduction system, a timing recovery system and at least one equalizer, said protocol comprising the steps of:

during a first phase:

maintaining the master in a half-duplex mode during which it transmits a signal but does not receive any signals,

maintaining the slave in a half-duplex mode during which it receives the signal from the master but does not transmit any signals,

converging the master near-end noise reduction system,

adjusting the frequency and phase of the signal received by the slave such that the frequency and phase are synchronized with the frequency and phase of the signal transmitted by the master,

converging the equalizer of the slave;

during a second phase:

maintaining the slave in a half-duplex mode during which it transmits a signal but does not receive any signals,

maintaining the master in a half-duplex mode during which it receives the signal from the slave but does not transmit any signals,

freezing the frequency and phase of the slave,

converging the slave near-end noise reduction system,

adjusting the phase of the signal received by the master such that the phase is synchronized with the phase of the signal transmitted by the slave,

converging the equalizer of the master; and

during a third phase:

maintaining the slave in a full-duplex mode such that the slave transmits and receive signals,

maintaining the master in a full-duplex mode such that the master transmits and receive signals,

reconverging the master near-end noise reduction system.

16. The protocol of claim 15 wherein the near-end noise reduction systems include an echo canceller and a NEXT cancellation system, the far-end noise reduction system includes a FEXT cancellation system and, during the first stage, the step of converging the master noise reduction system comprises the steps of adjusting the coefficients of the master echo canceller and NEXT cancellation system and, during the second stage, the step of converging the slave noise reduction system comprises the steps of adjusting the coefficients of the slave echo canceller and NEXT cancellation system and the protocol further comprises the steps of:

during the first phase, converging the slave far-end noise reduction system by adjusting the coefficients of the FEXT cancellation system; and

during the second phase, converging the master far-end noise reduction system by adjusting the coefficients of the FEXT cancellation system.

17. The protocol of claim 15 wherein the master near-end noise reduction system includes an echo canceller and, during the first phase, the step of converging the master near-end noise reduction system comprises the step of adjusting the coefficents of the echo canceller and the protocol further comprises the step of:

during the second phase, discarding the coefficients of the echo canceller.

18. The protocol of claim 15 wherein the master near-end noise reduction system includes a NEXT cancellation system and, during the first phase, the step of converging the master near-end noise reduction system comprises the step of adjusting the coefficents of the NEXT cancellation system and the protocol further comprises the step of:

during the second phase, discarding the coefficients of the NEXT cancellation system.

19. A startup protocol for use in a communications system having a plurality of transceivers, a first one of the transceivers acting as a master and a second

one of the transceivers acting as a slave, each transceiver including a transmitter and a receiver, comprising the steps of:

initially operating each of the first and second transceivers only as a transmitter and the other of the first and second transceivers only as a receiver to minimize a change in the operation of the transmitting transceiver transmitter as a result of the operation of the transmitting transceiver receiver and to provide adjustments in the timing of the receiving transceiver in accordance with the timing of the transmitting transceiver, and

thereafter operating each of the first and second transceivers simultaneously both as a transmitter and a receiver to minimize a change in the operation of the transmitter in the first transceiver as a result of the operation of the receiver in the first transceiver.

20. A startup protocol as set forth in claim 19 wherein,

during the initial operation of each of the first and second transceivers as a transmitter and the other of the first and second transceivers as a receiver, the receiver in the other of the first and second transceivers minimizes a change in the operation of the transmitter as a result of the operation of the transceivers acting in the plurality as transmitters.

21. A startup protocol, as set forth in claim 19, including the step of:

providing an operation of the first and second ones of the transceivers in transferring data between the transceivers after the simultaneous operation of the first and second ones of the transceivers both as a transceiver and a receiver to minimize a change in the operation of the transmitter in the first transceiver as a result of the operation of the receiver in the first transceiver.

22. A startup protocol as set forth in claim 19 wherein

the time for the operation of the second one of the transceivers as a transmitter and the first one of the transceivers as a receiver is initiated by a selective one of a fixed time or a signal from the second one of the transceivers and wherein

the time for the operation of both transceivers simultaneously as transmitters and receivers is initiated by a selective one of a fixed time or a signal from the first one of the transceivers.

23. A startup protocol as set forth in claim 19 wherein

in the initial operation, the adjustments in the timing of the receiving transceiver in accordance with the timing of the transmitting transceiver are fixed.

24. A startup protocol for use in a communications system having a plurality of transceivers; a first one of the transceivers acting as a master and a second one of the transceivers acting as a slave, each of the first and second one of the transceivers including a transmitter and a receiver, comprising the steps of:

initially operating, in a first phase, the first transceiver only as a transmitter and the second transceiver only as a receiver and adjusting the timing of the second transceiver in accordance with the timing of the first transceiver and minimizing a change in the operation of the first transceiver as a transmitter as a result of the operation of the first transceiver as a receiver, and

thereafter operating, in a second phase, the first transceiver only as a receiver and the second transceiver only as a transmitter and adjusting the timing of the first transceiver in accordance with the timing of the second transceiver and minimizing a change in the operation of the second transceiver as a transmitter as a result of the operation of the second transceiver as a receiver.

25. A startup protocol as set forth in claim 24, comprising the additional step of:

operating, in a third phase, the first and second transceivers simultaneously as transmitters and receivers to minimize a change in the operation on the transmitter in the first transceiver as a result of the operation of the receiver in the first transceiver.

26. A startup protocol as set forth in claim 24 wherein

the time for the initiation of the operation in the second phase is provided by a selective one of a fixed time after the initiation in the operation of the first phase or by a transmission of a timing signal from the second one of the transceivers to the first one of the transceivers and wherein

the time for the initiation of the operation in the third phase is provided by a selective one of a fixed time after the initiation in the operation of the second phase or by a transmission of a timing signal from the first one of the transceivers to the second one of the transceivers.

27. A startup protocol as set forth in claim 24 wherein

the transmission of data between the first one of the transceivers and the second one of the transceivers is initiated at the end of the third phase.

28. A startup protocol as set forth in claim 24 wherein

in the first phase the timing adjustment of the second transceiver in accordance with the timing of the first transceiver is fixed; and

in the second phase the timing adjustment of the first transceiver in accordance with the timing of the second transceiver and the minimizing of a change in the operation of the second transceiver as a transmitter as a result of the operation of the second transceiver as a receiver is fixed.